WE CLAIM:

1. A method for simultaneously determining multiple individual chemical concentrations of a liquid stream comprising:

subjecting at least a segment of the stream to ultraviolet light wherein the light penetrates a short distance into the segment and the effective path length of the light is a function of the refractive index of the segment;

generating an ultraviolet absorption spectrum from said ultraviolet penetration of the sample over a wavelength from 190 to 300nm; and

analyzing the ultraviolet absorption spectrum by a regression method to determine the component concentrations of the liquid stream.

2. A method according to claim 1 wherein the sample is subjected to ultraviolet light by an ATR-UV probe.

3. A method according to claim 1 wherein the sample is subjected to ultraviolet light by an ATR Tunnel flow cell.

4. A method according to claim 1 wherein the regression method is multivariate.

5. A method according to claim 4 wherein the multivariate regression method is the partial least squares method.

6. A method according to claim 1 wherein the regression method is linear.

7. A method according to claim 1 wherein the stream is a kraft liquor stream.

8. A method according to claim 7 wherein the measured component concentrations of the kraft liquor are selected from sodium hydroxide, sodium sulfide and sodium carbonate.

9. A method for simultaneously determining the sodium hydroxide, sodium sulfide and sodium carbonate concentrations of a kraft liquor stream comprising:

generating an ATR-UV absorbency spectrum of the liquor over a wavelength from 190 to 300 nm;

analyzing the ultraviolet absorption spectrum by a regression method to determine the component concentrations of the liquor.

10. A method according to claim 9 further comprising controlling operation of a kraft cooking digester, recausticizing unit, white liquor oxidation reactor or chemical recovery furnace in response to the determined chemical concentrations.

11. A system for determining chemical concentrations of a liquid stream comprising: an ultraviolet spectrometer, a device capable of providing ultraviolet absorption data between 190 and 300 nm, and a multivariate or linear calibration program for analyzing the ultraviolet absorption data.

12. A system according to claim11 wherein the device is an ATR optical probe.

13. A system according to claim 12 wherein the ATR optical probe is installed in a kraft liquor stream.

14. A system according to claim 11 wherein the device is an ATR tunnel flow cell.

15. A system according to claim 14 wherein the ATR tunnel flow cell is installed in the ultraviolet spectrometer and a kraft liquor stream flows through the ATR tunnel flow cell.

16. A system for determining chemical concentrations of NaOH and Na_2CO_3 in a kraft liquor stream comprising:

an ultraviolet spectrometer,

an attenuated total reflectance device capable of providing ultraviolet absorption data between 190 and 300 nm wherein the attenuated total reflectance device transmits the ultraviolet absorption data to the ultraviolet spectrometer by fiber optic cable,

a multivariate or linear calibration program for analyzing the ultraviolet absorption data.

17. A system according to claim 16 wherein the attenuated total reflectance device is an ATR optical probe installed in a kraft liquor stream.

18. A system according to claim 16 wherein the attenuated total reflectance device is an ATR tunnel flow cell installed in the ultraviolet spectrometer and a kraft liquor stream flows through the ATR tunnel flow cell.